



Research Article

COVID-19 Pandemic Effect on Stress Levels and Sleep Patterns

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ABSTRACT

Background: Physical distancing during COVID-19 pandemic had important role to prevent and slow down its transmission but has some negative psychological effects such as stress, confusion, frustration, and sleep pattern changes. **Objective:** The aim of this study was to determine the effect of the COVID-19 pandemic on stress levels and sleep patterns. **Methods:** This was a cross sectional study that involved a hundred medical students of Universitas Sumatera Utara. The data of this study was obtained by questionnaires and analyzed using Spearman correlation test. **Results:** This study found that based on the stress level, there were 59 students categorized normal, mild 16 students, moderate 10 students, severe 9 students, and very severe 6 students. The sleep patterns described that only 11 students slept normally and 89 students experienced sleep disturbances during the COVID-19 pandemic. This study found there was a significant correlation between the COVID-19 pandemic on stress levels ($p:0.01$ and $r:0.58$) and sleep patterns ($p:0.01$ and $r:0.36$). **Conclusion:** This study found that the COVID-19 pandemic had a significant impact on increasing stress levels and causing sleep disturbances among medical students. Strengthening mental health support during pandemics is essential to minimize these effects.

Keywords: COVID-19 pandemic, sleep patterns, physical distancing, stress level, students

1. Introduction

Mental health during the COVID-19 pandemic is a serious matter, especially for students.[1], [2] Coronavirus disease 2019 (COVID-19) is an infectious disease with high transmissions like Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV). SARS CoV2 is a new type virus that never been identified in humans, and on January 30, 2020, World Health Organization (WHO) has declared it as a Public Health Emergency of International Concern (PHEIC) [3].

According to the WHO in 2020, the COVID-19 pandemic had an impact on psychological status [4]-[5]. In order to stop the virus transmission, some policies have been made such as always wearing a mask, physical distancing, washing hands frequently, working from home (WFH), coughing and sneezing safely [6]. These policies will decrease people interaction among others that contribute to stress condition. Also the information about the fatal cause of COVID-19 that can be found anywhere has a role in leading to depression [7].

The Chinese survey showed that during the COVID-19 pandemic 53.8% of respondents experienced of moderate or severe symptoms psychological impact; 16.5% had moderate to severe depressive symptoms; 28.8% experienced moderate to severe anxiety symptoms, and 8.1% reported experiencing moderate to severe stress that would impact daily activities such as sleep patterns [7]. The psychological condition experienced by people is anxiety when infected, uncertainty about disease, and inability to adapt [8].

Another study in Egypt "Impact of the COVID-19 Pandemic on Mental Health and Social Support among Adult Egyptians" of 1,867 respondents also said 41.4% experienced a severe impact, 34.1% stress due to work, 55.7% financial stress, 62.7% were stressed due to being laid off, 53.9% experienced fear, 52% experienced feelings of helplessness and 66.3% felt worried [9]. When facing a COVID-19 pandemic situation, individuals will feel uncomfortable and less calm, which affects the quality of their sleep. Social support is needed such as a sense of empathy, accompanying individuals when they are experiencing problems, and creating a warm and comfortable atmosphere, making them feel cared for and loved so that individuals will be better to deal with problems [10].

Stress itself will result in psychological disturbances and activities related to the behavior undertaken.[6] During sleep well, melatonin is produced and increased that can reduce anxiety and results in a good immune system. The aim of this study was to examine the correlation between COVID-19 pandemic on stress levels and sleep patterns.

2. Methods

This is an analytical study with a cross sectional design and the population of this study was students from the Faculty of Medicine, Universitas Sumatera Utara (USU). This study was conducted from June 2020 to January 2021. The sample was taken by stratified random sampling, the exclusion criteria for this study were students who consumed sedative drugs, certain substances that had insomnia effect, had or are being diagnosed by a doctor with severe mental disorders, and had a history of sleep disorders (insomnia).

The pandemic situation was assessed by The COVID-19 pandemic questionnaire that had been validated previously, the stress level was determined by the Depression Anxiety Stress Scale [10] and the sleep patterns using the Pittsburgh Sleep Quality questionnaire.[11] Those questionnaires were spread by online using the social media as Google form link. The questionnaires of depression anxiety stress scale (references no 10) and the questionnaires of Pittsburgh sleep quality index (reference no 11) attached in this journal and the questionnaires had been translated into bahasa.

3. Results

The characteristics of the subject were shown on Table 1. Most of the students had normal (59%) stress level and 89 students (89%) had sleep patterns disorder (see Table 1).

Table 1. Subjects Characteristics

Characteristics	n (%)
Sex	
Male	39
Female	61
COVID-19 pandemic	
High	78
Low	22
Stress level	
Normal	59
Mild	16
Moderate	10
Severe	9
Very severe	6
Sleep patterns	
Good	11
Poor	89

This study found there was a significant positive correlation between COVID-19 pandemic on stress levels (p value 0.01 and r value 0.58) and sleep patterns (p value 0.01 and r value 0.36) (Table 2).

Table 2. The correlations between COVID-19 pandemic on stress level and sleep patterns

Variables	COVID-19 Pandemic		p value	r value
	Low	High		
Stress level				
Normal	32	27	0.01*	0.58
Mild	0	16		
Moderate	0	10		
Severe	1	8		
Very severe	0	6		
Sleep patterns				
Good	10	1	0.01*	0.36
Poor	70	19		

*p value<0.05, Spearman correlation test

4. Discussion

This study found there was a significant correlation between COVID-19 pandemic on stress level and sleep patterns. This indicated that the COVID-19 pandemic is still a difficult thing to accept in every circle, especially medical students due to changes in the learning system from face to face to the online system [12]. Previous study on 7.143 students showed that 0.9% of students had severe anxiety, 2.7% had moderate anxiety, and 21.3% had mild anxiety. In addition, having relatives or acquaintances infected with COVID-19 is a risk factor for student of becoming anxiety (OR = 3.007, 95% CI = 2.377 – 3.804) [13]. Stress itself focuses on coping mechanisms when responding problems [14]. Most of the stress on students caused by a large amount of material to be studied, lack of free time, and academic pressure that is full of competition and separation from loved ones, also decreases productivity [15]. The status of pandemic or the global epidemic indicated that the transmission of COVID-19 was very fast and this status forced the government to implement some new policies such as work from home and social distancing [16]. This condition came suddenly making people unprepared to face it physically and psychologically [17]. Among the psychological conditions experienced by society is the feeling of anxiety about being infected [18]. Anxiety is an emotional state that arises when an individual is stressed, and is characterized by tense feelings, worried and accompanied by physical responses such as a fast heartbeat and increased blood pressure [19].

Another study on medical students in 2016 at Universitas Sumatera Utara with chi-square test analysis showed that there was a significant correlation between stress levels and sleep quality with values ($r = 0.595$ and $p = 0.001$), [20] that indicated the higher the stress level, the worse the sleep quality [21]. Chronic insomnia also deteriorates and acute insomnia is now popping up because the difficulty limits the rest time and work time during the isolation period at home so that it is difficult to fall asleep when you have to sleep which adversely affects sleep continuity to lack of sleep at night and disturbing activity during the day [22].

A web-based study totaling 7.236 volunteers with a cross-sectional method and multivariate analysis test found 35.1% generalized anxiety disorder (GAD), 20.1% depressive symptoms, and 18.2% sleep quality disorders. It shows that health care workers are at high risk of poor sleep quality, also the prevalence of GAD <35 years in younger people, depressive symptoms is much higher than in older people [23].

5. Conclusion

This study found that the COVID-19 pandemic is closely related to both psychological and mental health, one of which also has impact on stress level and sleep patterns, the inability to adapt in the middle of the pandemic will cause anxiety, as well as the ambiguity of disease and limited activities to make this sustainable.

6. Data Availability Statement

The datasets generated and analyzed during the current study are not publicly available due to privacy and ethical considerations but are available from the corresponding author upon reasonable request.

7. Ethical Statement

This study was approved by Research Ethics Committee of Universitas Sumatera Utara with number 310/KEP/USU/2020 and Sumatera Medical Journal (SUMEJ) is a peer-reviewed electronic international journal. This statement clarifies ethical behavior of all parties involved in the act of publishing an article in Sumatera Medical Journal (SUMEJ), including the authors, the chief editor, the Editorial Board, the peer-

reviewer and the publisher (TALENTA Publisher Universitas Sumatera Utara). This statement is based on COPE's Best Practice Guidelines for Journal Editors.

8. Author Contributions

All authors contributed to the design and implementation of the research, data analysis, and finalizing the manuscript.

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11. Conflict of Interest

Authors declares no conflict of interest.

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